

EXHIBIT E

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

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UNITED STATES OF AMERICA	:	
	:	
Plaintiff,	:	
v.	:	20 Cr. 15 (PKC)
	:	
VIRGIL GRIFFITH,	:	
	:	
Defendant.	:	

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DECLARATION OF ANDREAS M. ANTONOPOULOS

I, ANDREAS M. ANTONOPOULOS, affirm under penalties of perjury pursuant to 28 U.S.C. § 1746:

1. I am an expert in cryptocurrency, Bitcoin, Ethereum, and blockchain technology. I am currently self-employed at the company I created in 2012, aantonop Operations LLC, which produces and publishes educational content related to Bitcoin, Ethereum, and other open blockchains. I am also a teaching fellow at the University of Nicosia, where I teach an open course for the Master's in Digital Currencies and create additional related curriculum. I have worked almost exclusively in the blockchain industry since 2012 and began focusing on cryptocurrency topics long before that.

2. In writing this declaration, I have relied upon my education, knowledge, experience, and training in computer science and blockchain technology, Ethereum, data communications, networks, and distributed systems detailed in the attached curriculum vitae. I have also relied upon my own research and publications in this field as well as other cryptocurrency conferences I have attended at which various experts presented the same or similar information to their audiences.

Cryptocurrency Basics

3. Cryptocurrencies are types of digital currency that depend on the applied mathematics of cryptography as means to store and exchange value. Examples of the most popular cryptocurrencies include Bitcoin, Ethereum, Dogecoin, Zcash, Ripple and Tether.

4. The issuance and transaction of cryptocurrencies are recorded on a distributed database called a blockchain. A blockchain is a database that acts as a digital ledger of transactions and is replicated and distributed across an entire network of participating computer systems. Cryptocurrencies and crypto assets are entries in these blockchains and are created and secured through cryptographic algorithms.

5. For example, the Bitcoin blockchain (for which bitcoin is the native token) is a public ledger that reflects all bitcoin transactions that occur anywhere in the world, for all time. There is no one entity that controls the Bitcoin blockchain; it is “decentralized,” meaning computers in the Bitcoin network record the transactions in the blockchain through “mining.” See Bitcoin White Paper, available at <https://bitcoin.org/bitcoin.pdf>. Although Bitcoin was the first crypto asset, created in 2009, there are many different blockchains with different native crypto assets, specifications, and governance systems. In some cases, different crypto assets and protocols are hosted on the same blockchain (*i.e.*, the Ethereum blockchain hosts its native cryptocurrency, Ether (symbol: ETH), but also several tokens under its ERC-20 protocol, and hosts Non-Fungible Tokens (NFTs), such as the ERC-721 protocol).

6. A “Node” refers to a computer participating in a network through an agreed communication protocol. This is achieved by running a piece of software called a client that “speaks” the protocol across the Internet and other communication networks. A client is an implementation of a protocol, such as that used by the Ethereum blockchain, that verifies all transactions in each block, keeping the network secure and the data accurate. However,

“nodes” are not specific to Ethereum and perform a variety of purposes not limited to cryptocurrency or blockchain technology but more broadly relate to Internet and Internet access generally. A node may participate in many different protocols. For example, your laptop is a node on your home Wi-Fi network, and your internet browser is a node on the web. The term node is even broader than computers: New York City is a node on the interstate highway network.

The Ethereum Network

7. Ethereum was invented in 2013 when Vitalik Buterin, the founder of Ethereum, published a white paper detailing the network’s mechanics and functionality. *See* Ethereum White Paper, *available at* <https://ethereum.org/en/whitepaper/>. The Ethereum network exists as several overlapping peer-to-peer networks that run on top of the internet and other communications systems.

8. Ethereum runs on “open source” software, which simply means that the software is publicly available, free to access, and can be shared among users. Open source software is similar to a public domain “recipe” that allows anyone to contribute to its development, create derivative uses of it, and use it on multiple platforms. The term “open source software” is often juxtaposed with the term “proprietary software,” which means the opposite.

9. The Ethereum blockchain is a data structure or database that consists of cryptographically secured blocks of transactions that originate from a single “genesis” block. The Ethereum blockchain emerges from the consensus of all the participants of the system through the application of the Ethereum protocol rules.

10. The Ethereum system operates by the decentralized issuance and use of a virtual currency called Ether. The Ether (ETH) currency is a utility currency, which means it is a

token that can be used to pay for the use of the Ethereum system. To process a transaction on the Ethereum network, the transaction creator must pay a fee in Ether, buying units of “gas” that are consumed by the processing of the transaction.

11. The Ethereum Foundation is a non-profit organization that supports Ethereum, funds critical development of Ethereum-related technologies, and provides educational materials related to Ethereum to the public. The Ethereum Foundation seeks to expand projects and entities in the Ethereum community and organizes Devcon, the annual conference for all Ethereum developers, researchers, and thinkers.

Publicly Available Materials Discussing Cryptocurrency and Ethereum

12. While cryptocurrency concepts have existed for decades, discussion and thought on cryptocurrencies became more popular in the mainstream a few years after the invention of Bitcoin, in 2013. At this time, the value of Bitcoin experienced rapid growth surpassing \$1,000 (USD) per BTC and attracting the attention of people outside of the small technical audience that had been interested from its inception.

13. There are many websites dedicated to educating the public about Ethereum, including the Ethereum Foundation’s website itself (<https://ethereum.org/en/what-is-ethereum/>). Other examples include <https://eth.wiki/> and <https://docs.ethhub.io/>. I began writing my book on Ethereum, Mastering Ethereum, in 2017 and published the first edition in 2018 on Github.com, which is an open source software website that allowed readers to access my book for free. See <https://github.com/ethereumbook/ethereumbook/blob/develop/preface.asciidoc>.

Information Conveyed by Mr. Griffith at the Pyongyang Conference

14. I have reviewed video and transcripts of the Pyongyang Conference at which Mr. Griffith presented in April 2019. It is my opinion that the information conveyed by Mr.

Griffith at the Conference was neither unique to that conference nor prepared or tailored specifically to that audience. In fact, it consisted of publicly available information that could have been accessed by any individual with access to the Internet, or academic papers, or books.

15. For example, Mr. Griffith gave a basic overview of blockchain technology. The nature of blockchain technology and cryptocurrencies as transnational, decentralized, and not susceptible to one country's regulation had been discussed widely on the internet for years before the Conference. *See, e.g.,* Emily Tatton, *Blockchain and Cryptocurrencies Undermine Financial Safeguards of WMD Nonproliferation Regime*, Center for Anticipatory Intelligence at Utah State University (Dec. 2018), available at <https://www.usu.edu/cai/files/studentpaper-tatton.pdf>; *Transcripts: Andreas Antonopoulos Canada Senate Bitcoin*, diyhplswiki, available at <http://dihypl.us/wiki/transcripts/andreas-antonopolous-canada-senate-bitcoin/>. Even the more specific connection between blockchain technology and sanctions regimes had been written about extensively before the Conference. *See, e.g.,* Yaya Fanusie, *Seeking Sanctions Resistance Through Blockchain Technology*, Forbes (Oct. 10, 2018), available at <https://www.forbes.com/sites/yayafanusie/2018/10/11/seeking-sanctions-resistance-through-blockchain-technology/?sh=6d61bd316392>; Deane R. Konowicz, *The New Game: Cryptocurrency Challenges US Economic Sanctions*, Defense Technical Information Center (Feb. 8, 2018), available at <https://apps.dtic.mil/sti/citations/AD1062142>.

16. Another topic discussed by Mr. Griffith at the Conference was smart contracts. In the context of the Ethereum network, a smart contract is an immutable computer program that runs deterministically in the context of an Ethereum Virtual Machine as part of the Ethereum network protocol—*i.e.*, on the decentralized Ethereum world computer.

17. The nature of smart contracts and their various uses had been written about in

publicly-available articles long before the Conference. *See, e.g.,* Smart Contracts Alliance, *Smart Contracts: 12 Use Cases for Business & Beyond*, Chamber of Digital Commerce (Dec. 2016), available at <https://digitalchamber.org/smart-contract-use-cases/>. A chapter from my book, “[What is a Smart Contract?](#),” was written before November 2018, and has been available on the Ethereum Foundation website. And Mr. Griffith previously published an article discussing game theory as it relates to smart contracts on March 29, 2019. *See* Virgil Griffith, *Ethereum is game-changing technology, literally*, Medium (Mar. 29, 2019), available at <https://medium.com/@virgilgr/ethereum-is-game-changing-technology-literally-d67e01a01cf8>.

18. In addition, more specific concepts that Mr. Griffith discussed related to “smart contracts” — such as how they do not rely on intermediaries or arbitrators, nor are they subject to traditional enforcement mechanisms — can be found in publicly-available academic papers dating back to 1996. *See* Nick Szabo, *Smart Contracts: Building Blocks for Digital Markets*, Department of Phonetic Sciences at the University of Amsterdam (1996), available at https://fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vwh.net/smart_contracts_2.html.

19. Even Mr. Griffith’s example of using a smart contract to provide weather insurance to places such as Puerto Rico and Sri Lanka had been discussed on the internet prior to the Conference. *See, e.g.,* Wolfie Zhao, *Blockchain Insurance Policy Developed for Hurricane-Prone Puerto Rico*, CoinDesk (Apr. 24, 2018), available at <https://www.coindesk.com/markets/2018/04/24/blockchain-insurance-policy-developed-for-hurricane-prone-puerto-rico/>; Etherisc, *Aya Miyaguchi and Virgil Griffith Join Etherisc Advisory Board*, PR Newswire (Mar. 5, 2019), available at <https://www.prnewswire.com/news-releases/aya-miyaguchi-and-virgil-griffith-join-etherisc->

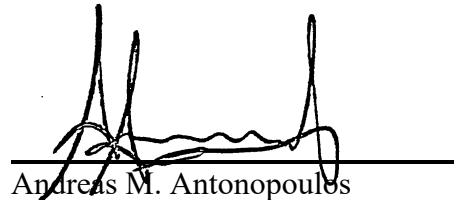
[advisory-board-300806417.html](#); Etherisc, *Etherisc, Aon and Oxfam in Sri Lanka on a Mission: to Expand Inclusive Insurance in Sri Lanka*, Etherisc Blog (Nov. 29, 2018), available at <https://blog.etherisc.com/etherisc-aon-and-oxfam-in-sri-lanka-on-a-mission-to-expand-inclusive-insurance-in-sri-lanka-696b51c98d9b>. And Mr. Griffith himself had previously presented on the same topic in 2018. See Virgil Griffith, *Special Projects 2018*, SlidesLive, at 3:20, available at <https://slideslive.ch/38911747/special-projects-2018?ref=speaker-13921-latest>.

20. Ultimately, nothing about the information presented by Mr. Griffith or others during the Conference was tailored to or otherwise unique to that particular event or locale. The information presented by Mr. Griffith was known ubiquitously in this industry and was not innovative or novel.

I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Dated: New York, NY

March 4, 2022



Andreas M. Antonopoulos